

REMARKS

Claims 13 to 30 are currently pending in the present application.

It is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

Claims 13 to 17, 21, 22, 24 and 25 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,347,269 to Hayakawa et al. in view of U.S. Patent No. 4,773,013 to Crapanzano et al.

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must not be based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

As clearly indicated by the Supreme Court in the *KSR* decision, it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *See KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). In this regard, the Supreme Court further noted that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, at 1396. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

As to claim 13, it is respectfully submitted that the applied references do not disclose nor suggest the feature of an assumption of a constant gradient angle when estimating the vehicle mass as a function of time, as provided for in the context of the claimed subject matter. The present Specification (at page 3, lines 15-31) specifically discloses in this regard that when a vehicle is traveling along any route, gradient angle α of the roadway is a function of time t and if one assumes the change in gradient angle $\alpha(t)$ is very small in time interval dt considered, the influence of gradient angle $\alpha(t)$ may be assumed to be constant

for a time, so that gradient angle α may not have to be estimated, calculated or measured by a cost-creating sensor.

The Hayakawa reference *does not disclose or suggest that the gradient angle is assumed to be constant.* (See Hayakawa, col. 6, lines 1-4). The Final Office Action (at page 2) asserts that “Hayakawa shows that the gradient angle change *is assumed to be very small* during a time interval, therefore the influence of the gradient *may be assumed to be constant* for a time”. *However, assuming that the variation is very small is not the same as assuming that there is no variation (constant).* This is clear from the sections of Hayakawa referred to at pages 2 and 3 of the Final Office Action, which asserts that (according to Hayakawa) for certain roads and speeds frequency components related to a change in gradient are those of merely 2 Hz whereas the variation of the driving force contains components of 2 Hz or higher. Thus, in the Hayakawa device, a high-pass filter is required to remove the signal components of 2 Hz or lower.

As explained above, if the gradient angle was assumed to be constant, as in the presently claimed subject matter, the gradient angle would not have to be estimated, calculated or measured by a cost-creating sensor. In this regard, the high-pass filter of Hayakawa “measures” the variation in the gradient angle to determine if it is significant enough to include in the vehicle mass calculation. It is therefore respectfully submitted that assuming that there is a small gradient variation simply does not correspond to assuming that there is a constant gradient.

The Final Office Action also cites the text at col. 5, lines 5 to 15, of the Hayakawa reference. This text refers to an equilibrium relationship in which Δ *represents the change in the gradient.* Therefore, the Hayakawa reference does not disclose nor suggest an equilibrium relationship, as between a motive force and a sum of an inertial force and drive resistances, in which the mass and a gradient angle of a roadway are included as quantities, with respect to time, assuming a constant gradient angle, as provided for in the context of the claimed subject matter.

The Final Office Action (at pages 3 and 4) further asserts that “*If a cutoff frequency greater than the frequency of the gradient variations is selected, such as 2 Hz, Δ is eliminated or minimized*”. As asserted, inherency concerns anticipation and not obviousness. In any event, to the extent that the Final Office Action may be relying on the inherency doctrine, it is respectfully submitted that to rely on inherency, the Office must provide a “basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent

characteristics necessarily flows from the teachings of the applied art.” (See M.P.E.P. § 2112; emphasis in original; and see Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int’f. 1990)). Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic. In this regard, the Final Office Action specifically asserts that Θ is eliminated or minimized only “If a cutoff frequency greater than the frequency of the gradient variations is selected.” Thus, Θ will not necessarily be eliminated or minimized, so that an equation containing Θ simply does not necessarily correspond to an equation without Θ as a variable.

Accordingly, the Hayakawa reference does not disclose nor suggest an equilibrium relationship, as between a motive force and a sum of an inertial force and drive resistances, assuming a constant gradient angle, as provided for in the context of the presently claimed subject matter.

As further regards claim 16, Hayakawa does not in any way disclose nor suggest that mass is calculated from the following equation:

$$m = \frac{dF / dt}{da / dt}.$$

In particular, the Office Actions to date cite the text at col. 6, lines 26 to 41, of the Hayakawa reference, which refers to equation (5). According to the Final Office Action (at page 4), this equation can be solved for m instantly by “neglecting e(k) in which case equation (5) is equivalent to the equation in claim 16”. This is not, however the same as assuming that the gradient is constant (see col. 6, lines 37 to 39 of Hayakawa (“In the case that the residual error e(k) is neglected”; and “In the case that the residual error e(k) is not negligible”)).

In this regard, the Final Office Action specifically asserts that equation (5) is equivalent to the equation in claim 16 only if e(k) is neglected. Thus, e(k) will not necessarily be eliminated, so that an equation containing e(k) does not necessarily correspond to an equation without e(k) as a variable. It is therefore plain the Hayakawa reference does not disclose or suggest, as provided for in the context of the presently claimed subject matter, the feature in which mass is calculated from the following equation:

$$m = \frac{dF / dt}{da / dt}.$$

In short, the Final Office Action's conclusory assertion that it would somehow be obvious to solve the equation for instances where the variation in road gradient is negligible and can be ignored is wholly unsupported. In particular, it does not correspond to assuming that the gradient angle of the road will be constant as in the context of the presently claimed subject matter.

As to claim 24, it includes features like those of claim 13, and it is therefore allowable for essentially the same reasons as claim 13.

Accordingly, claims 13 and 24, are allowable, as are their respective dependent claims 14 to 17, 21, 22 and 25.

Claims 18 to 20, 26, 27 and 29 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano and further in view of U.S. Patent No. 6,164,357 to Zhu et al.

Claims 18 to 20 and 26 depend from claims 13 and 24 and are therefore allowable for the same reasons, since Zhu does not cure – and is not asserted to cure -- the critical deficiencies of the Hayakawa reference.

Claim 23 was rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano et al. and further in view of U.S. Patent No. 6,745,112 to Mori, "Floating-Point Computation Using a Microcontroller" by Randel et al., "Programming and Customizing the PIC Microcontroller" by Predko and U.S. Patent No. 6,567,734 to Bellinger et al.

Claim 23 depends from claim 13 and is therefore allowable for the same reasons, since the added references do not cure – and are not asserted to cure -- the critical deficiencies of the Hayakawa reference.

Furthermore, contrary to the assertions in the Final Office Action, it is respectfully submitted that it would not have been obvious to calculate the reciprocal value of the mass in the Hayakawa reference. According to the Office Actions to date, the Randal and Predko references supposedly disclose that "in situations where a value is repeatedly used as a divisor, it is more efficient to determine the reciprocal value and use it as a multiplier". (See Office Action of September 15, 2008 at page 11 (emphasis added)). Since, however, *Hayakawa does not involve calculations where the mass is repeatedly used as a divisor, using a technique for reducing the computational load by using the reciprocal value of the*

mass when repeatedly using mass as a divisor is not an obvious choice for improving the overall operational efficiency of systems for estimating the mass of a vehicle such as in Hayakawa. Accordingly, claim 23 is allowable for this further reason.

Claims 28 and 30 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hayakawa in view of Crapanzano et al. and further in view of U.S. Patent No. 6,745,112 to Mori, "Floating-Point Computation Using a Microcontroller" by Randel et al., and "Programming and Customizing the PIC Microcontroller" by Predko.

Claims 29 and 30 depend from claim 13, and are therefore allowable for essentially the same reasons, since the secondary references do not cure – and are not asserted to cure – the critical deficiencies of the other applied references.

As further regards all of the obviousness rejections, any Official Notice is respectfully traversed to the extent that it is maintained and it is requested that the Examiner provide specific evidence to establish those assertions and/or contentions that may be supported by the Official Notices under 37 C.F.R. § 1.104(d)(2) or otherwise. In particular, it is respectfully requested that the Examiner provide an affidavit and/or that the Examiner provide published information concerning these assertions. This is because the § 103 rejections are apparently being based on assertions that draw on facts within the personal knowledge of the Examiner, since no support was provided for these otherwise conclusory and unsupported assertions. (See also MPEP § 2144.03).

Accordingly, claims 13 to 30 are allowable.

CONCLUSION

It is therefore respectfully submitted that all of claims 13 to 30 are allowable. It is therefore respectfully requested that the rejections (and any objections) be withdrawn, since all issues raised have been addressed and obviated. An early and favorable action on the merits is respectfully requested.

Dated: 7/27/2009

Respectfully submitted,

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